

## DETAILS OF INTERESTING CLAIM

No:

Type of Insurance:

**CAR**

Description of damaged item:

**Business centre building with total area of 85,000 m<sup>2</sup>**

Cause of Loss:

**(9) Impact of abnormal settlement of an old office building adjacent to the new business centre under construction**

Claim Cost (100%)

**US\$ 2 Mio (paid)**

Description of Incident and Loss Prevention measures initiated:

The new business centre building with nine aboveground and four underground floors was being constructed in the city centre, close to the river. Before the construction commenced the foundations of the surrounding buildings had been reinforced by 475 soil-cement piles 9 m long (jet-grouting method). The works started from construction of 19-22 m deep diaphragm walls of the total area of 12000 sq. m. To exclude water flow to the excavation pit (bottom of the pit lays 12 meters below the ground water level) diaphragm wall footings were embedded in water-resistant clay at 1.5 m. Due to unfavorable soil conditions and in order to minimize the effect on the surrounding housing development and environment, the "up-and-down" construction method was utilized. The load bearing bored columns of high precision were erected from the surface level extending to more than 26 m down. The aboveground floors were constructed simultaneously with underground floors, one by one from the ground surface level in opposite directions (up and down). Certain areas of underground floors were not concreted in order to provide access for excavation works at lower levels and metal structures were utilized as temporary support.

By the time when the loss occurred, two underground floors had been completed and excavation of the third one was in progress deepening to -15 m. Sudden settlement of the adjacent old building caused excessive side pressure on the structures of the new building under construction resulting in partial displacement of the diaphragm wall, cracks in conjugations of the load bearing columns and floors, deformation of metal structures of temporary support. Displacement of the diaphragm wall led to opening of its joints and seepage of ground water into the pit. Subsequent recovery works mainly comprised repairs of the conjugations of the load bearing columns and floors, cementing of joints in the diaphragm wall, replacement of temporary support metal structures, sealing the openings between the columns and water-resistant clay bed.

Outline the interesting or unusual aspects of this claim or problems experienced during settlement:

The city authorities appointed a special committee to investigate the incident but it could never establish the cause of this loss for sure. Initially it was believed that the settlement on the neighboring building had been the effect of the new construction in the immediate vicinity, particularly possible alteration of ground water table after construction of the diaphragm wall. However, further investigation revealed that the settlement of the building occurred due to inadequate condition of its foundation - old wooden piles placed in water-saturated soil simply rotted. Apparently, additional water arrived in soil from numerous leakages in the worn-out water main in the basement of the old building.

Normally, when projects with deep foundation in densely built-up areas are assessed, possible influence of new development on the surrounding buildings is a matter of concern and special attention is paid to TPL exposure. This loss example shows the reversed situation - the new construction was affected by settlement of the existing neighboring building. Moreover, reinforcement of the old foundation by soil-cement piles (undertaken before commencement of the new construction) and adjacent diaphragm wall prevented the old building from total collapse.

## **CODES**

### 1. Type of Insurance

M Machinery Breakdown

BE Boiler Explosion

LP(M) M - Loss of Profits

ALOP (DSU) Advance Loss of Profits

EAR Erection All Risks

CAR Contractors All Risks (Civil)

G Guarantee

EE Electronic Equipment

O Other Classes

### 2. Cause of Loss

(1) Faulty operation

(2) Faulty material or workmanship

(3) Faulty design

(4) Fire

(5) Explosion

(6) Storm

(7) Flood and Inundation

(8) Earthquake

(9) Other causes